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# **Report on Survey of U.S. Shipbuilding and Repair Industry**

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\* 1973 \*

REPORT ON SURVEY OF U. S.  
SHIPBUILDING AND REPAIR INDUSTRY

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## STATUS OF THE U.S. SHIPBUILDING AND SHIP REPAIR INDUSTRY

### Introduction

In compliance with the requirements of the Merchant Marine Act of 1936, as amended,<sup>1/</sup> the Office of Ship Construction conducts an annual survey to obtain information from the shipbuilding and ship repair industry that is used primarily to determine if an adequate mobilization base exists for purposes of national defense and national emergency. The purpose of this paper is to report on the 1973 survey of shipyard facilities but is not intended to evaluate or otherwise determine the adequacy of the mobilization base of the shipbuilding and ship repair industry. The statistical data

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#### <sup>1/</sup> Section 210

"It shall be the duty of the Secretary of Commerce to make a survey of the American merchant marine, as it now exists, to determine what additions and replacements are required to carry forward the national policy declared in Section 101 of this Act, and the Secretary of Commerce is directed to study, perfect, and adopt a long-range program for replacements and additions to the American merchant marine so that as soon as practicable the following objectives may be accomplished: ..... Fourth, the creation and maintenance of efficient shipyards and repair capacity in the United States with adequate numbers of skilled personnel to provide an adequate mobilization base."

#### Section 211

"The Secretary of Commerce is authorized and directed to investigate, determine, and keep current records of - (g) The number, location, and efficiency of the shipyards existing on the date of the enactment of this Act or thereafter built in the United States."

#### Section 502(f)

"The Secretary of Commerce, with the advice of and in coordination with the Secretary of the Navy, shall, at least once each year, as required for purposes of the Act, survey the existing privately owned shipyards capable of merchant ship construction, or review available data on such shipyards if deemed adequate, to determine whether their capabilities for merchant ship construction, including facilities and skilled personnel, provide an adequate mobilization base at strategic points for purpose of national defense and national emergency."

accumulated by the survey is, however, a major input into the quantitative assessment of the nation's ship construction and ship repair capability. This capability will be compared with Department of Defense scenarios involving various contingency attrition rates and emergency civilian shipping requirements to determine the adequacy of the shipbuilding mobilization base. A report on the mobilization analysis will be issued at a later date.

The survey also provides a data base that is used to evaluate the feasibility of proposed shipbuilding programs. Determinations are made regarding which existing shipyards might construct proposed ships consistent with ship size and delivery date requirements. The need for construction of new facilities to meet the demands of proposed shipbuilding programs can also be identified. The data gathered by the annual survey is also used extensively in MarAd responses to queries received from a variety of interests, including members of Congress, the Secretary of Commerce, the Department of Defense and the Office of Management and Budget.

Each year in late spring, Standard Form 17, "Facilities Available for the Construction or Repair of Ships", is mailed by MarAd to approximately 160 shipyards and ship repair facilities. The form was developed jointly by MarAd and Navy under the general guideline that all data accumulated would be treated as confidential. A completed Form 17 represents a detailed description of a shipbuilding or ship repair facility. The information requested, and available for official use, can be reviewed on a blank Form 17, attached as Appendix A.

Upon receipt of a Form 17 from industry, MarAd forwards a copy to the Office of the Coordinator for Ship Repair and Conversion which maintains appropriate records of available facilities and capacities of various shipyards and repair plants to enable the Department of Commerce and the Department of Defense to use such facilities to the best advantage. Form 17 also serves as a primary data input to the Industry Evaluation Board Summary Analysis conducted by the Bureau of Domestic Commerce in cooperation with MarAd. The Office of Preparedness in the General Services Administration is also a recipient of this information as required.

### General

The annual survey for 1973 has been completed and all information collected is available for official use. The data has been organized and condensed in the following narrative, exhibits and tabulations to focus attention on those elements that are most often requested from this Office. Emphasis within MarAd during 1973 was placed on the successful continuation of the New Maritime Program and this is reflected in the report by the amount of consideration given to shipyards capable of new ship construction.

Appendix B is an especially valuable statistical abstract of data gathered from those companies responding to the annual survey. It lists the nation's major shipbuilding and ship repair and drydocking yards sorted on a coastal basis. Information is displayed pertaining to the size and type of each building position, pier and berth space, channel depths, employment and remarks regarding yard activities.

### Major Shipbuilding Facilities

A major shipyard is defined for purposes of this report as one having at least one building position, either an inclined way, a side launching platform or a building basin, with the capability to accommodate a maximum ship size of 475 feet length-over-all (LOA) and a beam of 68 feet. These dimensions represent the smallest size ship that would be mass produced for mobilization purposes. There are presently 25 active shipyards classified in this category, identified and geographically located in Exhibit 1.



In response to the New Maritime Program, the major shipyards have expended \$148 million for modernization since 1970, \$51 million having been spent in 1973. It is anticipated that an additional \$435 million in improvements and new facility construction will occur in the next few years to accommodate huge fuel carriers; some of these ships have already been contracted for. As of July 1, 1973, MarAd was subsidizing a backlog of 55 ships in nine shipyards with a total contract value of \$2.5 billion. MarAd was also providing mortgage guarantee insurance for 255 craft worth \$552 million in 32 construction facilities. These are pictorially displayed in Exhibits 2 and 3.

Table I has been prepared to satisfy the constantly received query; how many building positions are available to build a specified ship.<sup>1/</sup> A single shipway or basin may have several building positions dependent on the size of the ships being constructed. For example, the 1200 feet by 192 feet basin at the Bethlehem Sparrows Point shipyard can accommodate one 265,000 DWT tanker or four of the smaller mobilization ships. The ship types listed, with the exception of the mobilization ships, are those presently under construction or recently delivered to commercial service. The number

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<sup>1/</sup> The usual accompanying questions to the query relating to when the ships can be delivered and what effect a new proposal will have on the existing program or work under contract, will be addressed in a report describing the shipyard mobilization and capability model recently developed in the Office of Ship Construction.

of building positions vary from 115 for the small mobilization ship to two for the huge 380,000 DWT tanker. Length-over-all and beam are given for all ships and deadweight tonnage for the bulk carriers.

Table II is a somewhat different presentation of the data, meaningful to many requesting information from the annual survey. In lieu of actual ships, maximum ship length is used to determine the number of shipways or basins available. In this tabulation the emphasis is on the number of individual facilities available and not on the number of ships that can be constructed. Using Sparrows Point again as an example, Table II indicates the 1200 feet by 192 feet basin as one facility regardless of what type of ship is constructed in it. Table I indicates that there are 12 building positions for a ship 475 feet LOA at Sparrows Point whereas Table II indicates that the yard has seven individual shipways capable of constructing a ship 475 feet in length. Exhibit 4 is a histogram displaying the reduction in the number of available shipways as the maximum ship length increases.

Following is a brief description and present status of those yards either presently or recently engaging in the construction of ocean going merchant ships.

1. Bath Iron Works Corporation

Located on the Kennebec River at Bath, Maine, the Bath Iron Works Corporation (BIW) is an old established shipyard engaged in both Navy and commercial ship construction. The yard has a history of proven

diversity having constructed various ship types in the past including containerships, tankers, destroyers and guided missile frigates. They are presently constructing five 25,000 DWT tankers for Marine Ship Leasing Corporation and have secured contracts to build four roll-on/roll-off ships (MA Design C7-S-95a) for States Steamship Company. BIW also engages in some conversion and topside repair work when drydocking is not necessary.

The yard is currently undergoing a \$10 million modernization program, \$6.65 million having been expended during fiscal year 1973. The upgrading of facilities includes the reconstruction of two shipways to accommodate ships of 700 feet in length with a maximum beam of 132 feet, the installation of a 220 ton level luffing crane with sufficient outreach to erect units on all shipways and new steel fabrication shops and equipment that will double steel throughput capacity.

In addition to the building positions presently being modernized, BIW has one other shipway that can accommodate a ship 650 feet in length and a beam of 88 feet. The yard does not have a drydocking facility<sup>1/</sup>; therefore, repair capacity is limited to topside and inboard work. Two wharves and a pier provide a total of 2,900 linear feet for outfitting and repair work. Each wharf is serviced by a 25 ton rotating crane and the pier by a 90 ton gantry crane.

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<sup>1/</sup> There is a special floating partial drydock used exclusively for the installation and repair of sonar domes.

BIW operates a second facility, the Hardings plant, located three miles from the shipyard, where much of the initial steel fabrication takes place. At this plant steel is blasted and sprayed, cut, straightened or shaped. The steel is then transported to Bath by truck or rail where it is joined together into subassemblies for final erection at the shipway. The yard is not considered to be automated although some numerically controlled burning and one-sided welding equipment are employed.

The current administrative and production work force is approximately 2,250, down from the 1972 average daily employment of 2,760. This decline is attributed to the fact that additional contracts were not secured in time for new keels to be laid immediately on building positions that became available due to the launching of on-going ships. It is estimated that the yard work force could be expanded to 12,000 employees under conditions of mobilization.

2. General Dynamics Corporation

The Quincy Shipbuilding Division of the General Dynamics Corporation is located on Quincy Bay, eight miles south of Boston, Massachusetts. The yard was purchased from Bethlehem Steel Corporation in 1963 and was used for several years thereafter in the construction of auxiliary vessels for the U.S. Navy. In 1970, a keel was laid for the first of three Seabee Barge Carriers for Lykes Brothers Steamship Company. The last

ship of that series was delivered to the owner on March 16, 1973. The most recent awards were for seven liquefied natural gas (LNG) tankers that will be operated by Burmah Oil Shipping, Inc.

In order to accommodate the LNG tankers, General Dynamics anticipates a modernization program amounting to \$20 million, \$5.5 million having been expended in fiscal year 1973. In addition to the reconstruction of building positions, a 1200-ton gantry crane to erect the cryogenic containment spheres is being installed.

The LNG erection schedule is worthy of note due to its unique use of the facilities. Shipways No. 11 and No. 12 are presently being demolished and new Basins No. 11 and No. 12 are being erected to accommodate ships up to 865 feet in length and 144 feet and 145 feet in beam, respectively. Since the LNG's are 936 feet LOA, hull erection in Basins No. 11 and No. 12 will exclude the bow. Following float-out from No. 11 or No. 12 the ships will be floated into Basin No. 7 for bow erection and sphere installation. Basin No. 7 can accommodate a maximum ship size of 940 feet by 143.5 feet. The bows of the LNG's will be constructed at the inboard end of Basin No. 6 and sections lifted over into No. 7 where they will be attached to the hull. The spheres will be barged into the outboard end of No. 6 and lifted into No. 7 for installation. Basin No. 8, not presently being used, and Basin No. 6 can accommodate ships 860 feet LOA and 123.5 feet in beam.

The yard has extensive capability to do topside and inboard repair work. Four piers and a wet basin are available with a total dock-side accessibility of 4,600 linear feet. Each pier and the wet basin are serviced by adequate crane capacity for outfitting and general repair work. The yard does have a 10,000 ton, wood-sectional floating drydock capable of accommodating a maximum ship size of 550 feet by 75 feet. The basins can also be used as drydocks for repair when not in use for new construction or conversion. Automatic Data Processing, including AUTOKON-71, is utilized to a degree with greater implementation planned for the future.

Employment in the yard decreased dramatically in 1973 from 6,579 to 2,440 due to the completion of the Lykes Seabee Barge Carrier program. It is anticipated, however, that higher employment levels will be reached during 1974 due to the new LNG contracts. It is estimated that the work force could be expanded to as many as 24,000 employees under conditions of mobilization.

### 3. Seatrain Shipbuilding Corporation

In 1969 Seatrain Lines, Inc. agreed to take over the former Brooklyn Navy Yard to build 225,000 DWT tankers on an assembly-line basis. Four tankers of this size have been contracted for to date with the first delivery made on December 31, 1973.

Although the facilities that existed in 1969 included two massive graving docks to accommodate a maximum ship size of 1094 feet by 143.5 feet and three large fabricating buildings, Seatrain has expended \$28 million on modernization. This includes \$2.77 million spent in 1973 for equipment improvements for plate preparation, refurbishing the fabricating shop and a module painting facility. Automation, including AUTOKON-71, is widely used in steel processing and most recently a prototype of an adjustable work platform (scissor staging) has been assembled.

Steel handling in this yard is extremely efficient and is designed to insure that substantially all work, except the actual hull erection in the graving dock, is performed indoors in temperature-controlled, protected areas. Raw steel is pre-processed in the plate preparation building where it is shotblasted, coated and precision cut with automated numerically controlled cutting machines. The plate is then transferred to either the flat or curved panel building for fabrication. In the flat panel building automatic welding machines are used to make up rectangular modules with a maximum weight of 200 tons. Bow and stern shell modules are fabricated in the curved panel building where bending rolls are capable of curving 2-inch plate into cylindrical shapes up to 30 feet in length. The modules are then painted in a temperature controlled, sheltered building equipped with high volume fans and filters to provide a safe, non-toxic environment. The modules are then transported

on assembly line conveyors through the outfitting building for required piping, electrical work, mechanical equipment, sheet metal work and joiner work before being moved on to the graving docks.

A smaller basin, in need of repair, is also available that can accommodate a maximum ship size of 720 feet LOA and 112 feet in beam. Although the yard is presently specializing in new construction, there is over 3,190 feet of berthing space available that could be used for topside repair. Most of this pier space is serviced by several 75-ton cranes. The basins are serviced by four 200-ton and four 75-ton capacity whirley cranes working separately or in tandem to lift completed modules into place.

The shipyard's employment increased during 1973 from 1,258 to 2,725. The maximum employment level under conditions of mobilization has not yet been determined.

4. Sun Shipbuilding and Dry Dock Company

Sun is an established, diversified shipyard bordering the Delaware River at Chester, Pennsylvania. In its 55 years of operation the yard has been engaged primarily in the construction of commercial vessels. During the past ten years the yard has completed a series of fourteen general cargo ships, eight containerships, seven tankers and will soon deliver the last of seven roll-on/roll-off ships. In addition to its shipbuilding



and repair activities the yard also engages in the manufacture of heavy industrial equipment including welded pressure vessels, plate work, machinery and oil refinery and chemical works equipment.

Sun is planning a \$40 million expansion program to be completed in early 1975. The expansion will give the yard the capability of building ships 1100 feet long with a capacity of 400,000 DWT. Two major features of the expansion are: (1) a new floating drydock which will be divided into two sections, and (2) a new level shipbuilding platform serviced by three 250 ton cranes. In addition to the drydock and platform, an outfitting pier will be constructed and fabrication capabilities increased accordingly. At present there are four shipways in good condition. The maximum ship sizes capable of being constructed on these ways vary from 700 feet by 92 feet to 745 feet by 132 feet. Larger vessels may be built in two sections and then joined together in the floating drydock which can accommodate ships up to 1005 feet by 135 feet. The largest vessel built to date at Sun was the MOBIL ARTIC, a 930 feet by 132, 126,000 DWT tanker.

The yard also engages in ship repair, conversion and special alterations such as the ice-breaking capability built into the tanker MANHATTEN. Five piers with a total usable length of 2800 feet are available for outfitting and topside repair. These wet docks are serviced by seven 21-ton gantry cranes, each with a maximum reach of 105 feet.

The work force engaged in marine work increased during the past year from 3,720 to 4,080. It is anticipated that an additional increase of 1,000 will result from work generated by the expansion program. It is estimated that the mobilization base employment is approximately 35,000.

5. Bethlehem Sparrows Point

Sparrows Point, the largest of Bethlehem Steel's shipyards, is located on the Patapsco River in the Baltimore, Maryland metropolitan area. This yard has been the most prolific in the nation during the past two decades, specializing in series construction of standard sizes of tankers plus freighters and containerships. Nine ships are presently under construction; five 265,000 DWT VLCC's, three 120,000 DWT tankers and one large containership.

Sparrows Point has substantially completed a significant facilities improvement program totaling approximately \$30 million. The major components of this program consisted of a building basin for the construction of vessels up to 300,000 DWT and a panel shop for fabrication of steel which cost about \$5 million. This panel shop is capable of constructing panels up to 60 feet square, 4 feet in depth and weighing up to 200 tons. It is estimated that this fabrication process can result in a savings approaching two percent of the total labor hours for the 265,000 DWT tankers presently under contract. Recent improvements at the yard also include a numerically controlled gas plate-cutting machine and an automatic plate and shape blasting-painting machine.

In addition to the large basin which can accommodate a maximum ship size of 1200 feet by 192 feet, Sparrows Point has six shipways in good condition. Two of these ways can accommodate a maximum ship size of 900 feet by 108 feet, three ways 650 feet by 90 feet and one way 575 feet by 80 feet. The yard does not have a drydocking facility; therefore, any repair capacity would be limited to topside and inboard work. Four outfitting berths are available with a combined length of 3,970 linear feet of space serviced by six tower cranes ranging in capacity from 15 to 50 tons. Several locomotive cranes of various capacities are also available.

The current work force of 3,925 did not rise or decline during the year indicating a stable employment situation. It is estimated that yard employment could be expanded to 15,500 under conditions of mobilization.

6. Maryland Shipbuilding and Drydock Company

The Maryland Shipbuilding and Drydock Company, a subsidiary of Fruehauf Corporation, is located on the south bank of the Patapsco River in the Port of Baltimore, Maryland. Although the yard is primarily a ship repair or conversion facility, it does have the capability on one building way to construct ships up to 630 feet LOA and 96 feet in beam. Maryland also engages in a considerable amount of non-marine work including steam surface condensers, cranes, bridges, steel tunnels, gas turbines, compressors, pumps, fractioning towers and other pressure vessels.

The Fruehauf Corporation has budgeted between \$20 and \$25 million for shipyard improvements consisting of:

- a. Lengthening one building way to 1,000 feet and including cranes and steel erecting equipment; and
- b. The purchase of a 45,000 ton capacity floating drydock, scheduled for delivery on June 1, 1974, which can accommodate a maximum ship size approximately 827 feet long and 150 feet wide. During fiscal year 1973, Maryland expended \$2,680,000 for capital improvements.

Maryland presently has two floating drydocks that are used primarily for repair and conversion work. The maximum ship sizes that can be accommodated are 775 feet by 106 feet and 715 feet by 90 feet, respectively. There is 5,650 feet of pier side berthing available for topside and inboard repair. Fourteen gantry cranes ranging in capacity from 20 to 65 tons service the drydock and berthing areas.

The current administrative and production work force is approximately 1,720, down from 1,830 in 1972. Additional contracts generated by the facility improvement program will hopefully increase employment during the next year to 2,700. It is estimated that the yard can absorb approximately 12,000 men during a mobilization situation.

7. Newport News Shipbuilding and Dry Dock Company

The largest shipbuilding and repair facility in the nation is located on the James River in Newport News, Virginia. Since 1866, the yard has been a major producer of commercial and military ships including the SS UNITED STATES and all of the Navy's nuclear aircraft carriers. The yard is currently constructing seven nuclear submarines and nuclear guided missile destroyers in addition to two nuclear powered aircraft carriers. In September 1972, contracts were awarded to Newport News for the construction of three liquefied natural gas (LNG) tankers for use in commercial services.

Newport News has begun construction of a new facility adjacent to their present yard. This \$106 million addition will be used to build the three LNG's and hopefully ten 390,000 ULCC's for which they are now negotiating. A building basin 1600 feet long, 230 feet wide and 44 feet deep will be constructed wherein one ULCC or LNG tanker and part of a second can be built simultaneously. Lengthening the basin to 1800 feet is also being considered. A steel preparation building, panel shop, subassembly areas and a 900-ton gantry crane will also be added.

The yard has five inclined shipways; two of which can accommodate a maximum ship size of 940 feet by 125 feet, two a ship size of 715 feet by 93 feet and one a ship size of 447 feet by 93 feet (this shipway can

be extended to accommodate ships to 649 feet in length). In addition to the shipways, Newport News also has two large basins, 1100 feet by 140 feet and 960 feet by 128 feet, serviced by one 310-ton gantry crane.

Within the confines of the yard there are 70 production shops for steel processing and fabrication and the manufacture of machinery components. A fairly recent acquisition was a completely automated steel handling facility, including numerical control for lifting and cutting. Other computer applications in the yard include AUTOKON-71, contracted for from MarAd, PERT, used in planning and scheduling and automatic data processing in material control and accounting activities.

In addition to the two basins, Newport News also has three graving docks that can be used for new construction, repair or conversion. The largest of these can accommodate a maximum ship size of 862 feet by 118 feet. Nine piers for outfitting and topside repair are available with a combined berthing space of approximately 12,400 linear feet. These piers are serviced by cranes ranging in capacity from 28 tons to 156 tons.

The work force at Newport News is currently 26,600, an increase of 1,000 during the past 12 months. It is estimated that employment in the yard can be increased to 41,000 under mobilization conditions.

8. Alabama Dry Dock and Shipbuilding Company

Alabama Dry Dock and Shipbuilding Company is located approximately 30 miles from the Gulf of Mexico on Mobile Bay. The yard is situated on Pinto Island across the river from the city of Mobile, Alabama. Although the shipyard constructed 102 tankers and 20 cargo vessels during World War II, it has since been predominantly a repair and conversion facility. During the past year ADDSCO spent \$1,663,000 on capital improvements indicating that new contracts may be in the offing.

The shipyard has five side launching shipways, four of which can accommodate a maximum ship size of 523.5 feet by 68 feet and one a ship size of 620 feet by 90 feet. All of these ways are too small to use for the construction of today's mammoth ships. ADDSCO also has three floating drydocks that can accommodate maximum ship sizes of 750 feet by 105 feet, 620 feet by 84 feet and 380 feet by 64 feet, respectively. There is also 13,290 feet of berthing space available at nine finger piers for topside and inboard repairs. There are 20 revolving gantry cranes with capacities varying from 12 tons to 65 tons available to serve the shipway and berthing areas.

Current employment at the yard is approximately 2,640, a slight increase over the previous year. Based on World War II experience, it is estimated that employment could be increased to 26,000 under conditions of mobilization.

9. Ingalls Shipbuilding Division

The Ingalls Shipbuilding Division, a wholly owned subsidiary of Litton Industries, Inc., is actually two separate shipyards located on the Gulf of Mexico at Pascagoula, Mississippi. Ingalls is a diversified shipbuilding complex engaging in the construction, conversion and overhaul of commercial ships and Navy combatants and auxiliaries. In addition, the yard participates in ship systems analysis and design, operational effectiveness analyses, logistic system analyses and ship design concepts.

The older of the two yards, referred to as the East Bank yard, has been in operation for ~~36~~ years, engaging primarily in new construction of commercial cargo ships and tankers and is currently completing a series of highly productive containerships. The yard has seven inclined shipways, four of which can accommodate a maximum ship size of 650 feet by 90 feet, and the others; 690 feet by 85 feet, 555 feet by 90 feet and 550 feet by 80 feet, respectively. A small graving dock is available which is currently used for the construction of nuclear powered submarines. A wharf and four piers, serviced by cranes with a 50-ton maximum capacity, provide a total of 3,700 feet of berthing space for outfitting and topside repair.

The West Bank yard was completed in 1970 at an estimated cost of \$115 million. The yard was constructed primarily for Navy work and is scheduled to deliver five amphibious assault ships and sixteen destroyers by early 1977. The West Bank yard does not have conventional inclined



shipbuilding ways. Instead, fabricated steel and minor subassemblies are brought from the fabrication, panel and shell shops to the sub-assembly area where they are erected into major subassemblies which, in turn, move to the module assembly area. These areas are divided into five bays, each of which can produce 225 feet long, 6000-ton modules. After modules are completed in the module assembly area, they are moved to the integration area where they are erected into a complete ship. The completed ship is then moved onto a launch pontoon which is subsequently floated and moved to a deep water area where it is sunk and the ship launched. The West Bank yard can launch a maximum ship size of 1050 feet by 177 feet. It is estimated that the various assembly and subassembly areas are the equivalent of six conventional inclined ways in terms of the number of ships that could be delivered annually. Approximately 4400 feet of berthing space, serviced by cranes varying from 25 tons to 200 tons, is available for outfitting.

The total employment at the Ingalls Shipbuilding Division is approximately 17,000 and could be increased to 21,000 for mobilization purposes. Due to the long term Navy commitment, this high level of employment should continue for the next several years.

10. Avondale Shipyards, Inc.

Avondale Shipyards, Inc., a subsidiary of the Ogden Corporation, is located on the West bank of the Mississippi River, a few miles above the Huey Long Bridge in New Orleans, Louisiana. During the past ten years

the yard has expanded from a modest river facility to a major ship-building yard, increasing its work force five times over. Avondale has the distinction of being the only U.S. shipyard that has ever built a LASH ship; twenty having been contracted for since 1967. In addition to the LASH ships the yard has completed three tankers, five cargo ships and five coast guard cutters in the past few years and will complete a series of twenty destroyer escorts for the Navy by mid 1974. The yard was awarded a contract for three liquefied natural gas (LNG) tankers in June 1973; these will be delivered in 1976 and 1977. Avondale will spend an estimated \$40 million in capital improvements for the LNG program. The shipways will be reconstructed from the present three to five building positions, used in the destroyer escort program, to two positions to accommodate the width of the LNG's. Further, a new sectional floating drydock, 900 feet by 225 feet, will be constructed to facilitate launching. Additional buildings and equipment to supplement the yard's mechanized handling and fabrication systems will also be purchased.

Avondale has two side-launching construction facilities that can accommodate maximum ship sizes of 1200 feet by 130 feet and 600 feet by 80 feet, respectively. Three large ocean going vessels can be constructed simultaneously on the longer facility and five on the shorter. As many as six smaller vessels can be constructed simultaneously on the 1200 foot

facility so long as they are 600 feet or less in length. A unique assembly method, whereby large sections of a ship are moved horizontally from different building positions, is employed by Avondale. A ship will be situated and worked on in three different building positions between keel laying and launching. For the destroyer escorts, coast guard cutters and other relatively smaller vessels, the yard has perfected a system of down-hand welding of the hull which is mounted on a rotating jig. Modern construction methods and steel processing facilities have made Avondale one of the nation's most productive shipyards.

The yard offers almost 3600 feet of berthing space, serviced by six 30 ton to 50 ton gantry cranes, for outfitting and repair. A small floating drydock, 378 feet by 68 feet, is also available for repair of smaller Navy ships, river boats and barges.

Yard employment was reduced from 8792 to 7331 during 1973. This reduction is credited to modernization and automation of facilities. It is estimated that employment can be increased to 18,000 under conditions of mobilization.

11. National Steel and Shipbuilding Company

National Steel and Shipbuilding Company, jointly owned by the Morrison-Knudsen Company, Inc. and Kaiser Industries Corporation, is located on a 96-acre site at San Diego, California. The yard engages in both Navy and commercial work, having in recent years completed seventeen Tank

Landing Ships (LST's) and five large cargoliners. NASSCO is currently marketing several standard bulk carriers and have on order: one San Clemente Class, 80,500 DWT Oil-Bulk-Ore (OBO) carrier, five Coronado Class, 38,300 DWT tankers, and thirteen San Clemente Class, 89,700 DWT tankers. In addition to this backlog of commercial work that will keep the yard busy through mid-1978, NASSCO is also constructing a replenishment oiler (AOR) for the U.S. Navy.

During fiscal year 1973, NASSCO expended over \$3 million for capital improvements, particularly in the installation of a modern plate handling facility. The yard is currently considering a \$18 million expansion program to increase shipbuilding capacity. The program includes acquisition of additional land for steel fabrication and storage facilities, construction of an outfitting pier and a graving dock that would allow the yard to accept contracts for tankers and LNG's up to 150,000 tons.

The yard has four inclined shipways; two of which can accommodate a maximum ship size of 900 feet by 106 feet; one a ship size of 700 feet by 90 feet and one 605 feet by 90 feet, extendable to 700 feet if required. These ways are serviced by eight 125-ton and eight 60-ton gantry cranes. Two small drydocks are available for repair and a larger graving dock that can accommodate a maximum ship size of 683 feet LOA,

can be leased on a use basis from the Unified Port District of San Diego. Seven piers with a total berthing space of approximately 6,000 feet are available for outfitting and topside repair. These piers are serviced by 10 cranes varying in capacity from 5 tons to 25 tons.

The work force at the yard increased from 1,950 to 3,100 during 1973 and should increase further due to the large backlog of tankers. It is estimated that the yard can support 4,500 employees on a mobilization basis.

12. Todd Shipyards Corporation - San Pedro, California

The Los Angeles Division of Todd Shipyards Corporation is located at San Pedro, California. The yard was formerly the Los Angeles Shipbuilding and Dry Dock Company and was purchased by Todd in 1946. During the past decade the yard has constructed a series of destroyers for the U.S. Navy and converted several freighters and containerships for commercial operators. They are presently building four 25,000 DWT tankers that will be chartered by the Military Sealift Command and four 35,000 DWT tankers to be placed in private trade. In order to bid on tankers and OBO's in the 89,000 DWT range, Todd has already expended \$13 million of a \$20 million improvement program to reconstruct two shipways and to install a 175 ton crane. Additional modernization will begin subsequent to the yard acquiring a contract for the larger tankers.

The yard has two shipways that can accommodate a maximum ship size of 800 feet by 84 feet. These ways are serviced by four 25 ton cranes in addition to the new 175 ton crane. Two floating drydocks are available

that can accommodate ships no larger than 665 feet by 85 feet and 563 feet by 85 feet, respectively. A total of 4800 feet of berthing space is available at six piers for outfitting and topside repair. These piers are serviced by seven cranes varying in capacity from 25 tons to 50 tons.

During 1973, yard employment was reduced by 50 percent to its current level of 1350. This reduction was due primarily to the time lag between completion of a series of containership conversions and keel layings for the 25,000 DWT tankers. It is estimated that the work force could be increased to 8,000 under mobilization conditions.

13. FMC Corporation

The Marine and Rail Equipment Division of the FMC Corporation is located on the Willamette River in Portland, Oregon. This facility specializes in the construction of rail cars, barges, Navy assault boats and other small marine craft. The yard recently acquired contracts to build six 35,000 DWT tankers that will be chartered, for use in the domestic trade, to the Chevron Shipping Company, a wholly owned subsidiary of the Standard Oil Company of California.

To accommodate the expanded shipbuilding work, FMC acquired an additional 23 acres of land adjacent to their existing facility and invested \$1 million this past year in a 200-ton capacity whirley crane and new types of welding equipment, including a computer-operated burning machine for cutting steel plates. FMC plans to fabricate steel modules weighing up

to the 200 ton limit of the crane and transport them to the shipway for erection. Modular living quarters complete with carpets and bed spreads will also be erected to reduce outfitting time and cost.

The yard has one side-launching shipway that can accommodate a maximum ship size of 650 feet by 105 feet. This building position is serviced by one 200 ton and one 40 ton capacity crane. Two other shipways, 350 feet by 48 feet and 275 feet by 72 feet, are available for the construction of smaller craft. A total of 1060 feet of pier space is available for outfitting and repair. This pier area is serviced by four 10-ton truck cranes.

FMC presently employs 1,220 employees. It is estimated that this level could be doubled for mobilization purposes.

14. Lockheed Shipbuilding and Construction Company

The Lockheed Shipbuilding and Construction Company, a subsidiary of the Lockheed Aircraft Corporation, is located on the southern perimeter of Puget Sound's Elliott Bay at Seattle, Washington. In the past the yard has concentrated on Navy ships, having constructed a series of destroyers, amphibious transport docks, ammunition ships and the USNS SEALIFT, a roll-on/roll-off cargo ship operated by the Military Sealift Command. For commercial purposes the yard has constructed several ferry boats and recently delivered the 640 foot bulk carrier, SUGAR ISLANDER. Prospects for the future include a possible contract for three 90,000 DWT tankers to be built for the Ecology Two Corporation.

The yard has three inclined shipways that can accommodate maximum ship sizes of 690 feet by 90 feet, 600 feet by 90 feet and 595 feet by 86 feet, respectively. These ways are serviced by 10 whirley cranes varying in capacity from 28 tons to 50 tons. Three floating drydocks are available that can accommodate maximum ship sizes of 600 feet by 92 feet, 530 feet by 80 feet and 400 feet by 50 feet, respectively. Also available is 6500 feet of wharf and pier space that is used for both repair and outfitting. Thirteen whirley cranes ranging in capacity from 17 tons to 50 tons service the wharf and pier area.

The work force, at 1,500, has remained substantially unchanged during the past two years. During conditions of mobilization, the employment level can be expanded to approximately 6,600.



### Major Drydocking Facilities

Major drydocking facilities are defined here as those yards engaging primarily in repair or reconstruction and having at least one drydock that can accommodate ships 300 feet in length or above. These yards do not usually engage in new construction, however, the possibility does exist if the situation demanded it.

Appendix B tabulates information updated through 1973 on 37 of these yards on a coastal basis. Additional data is available for official use in the Office of Ship Construction.

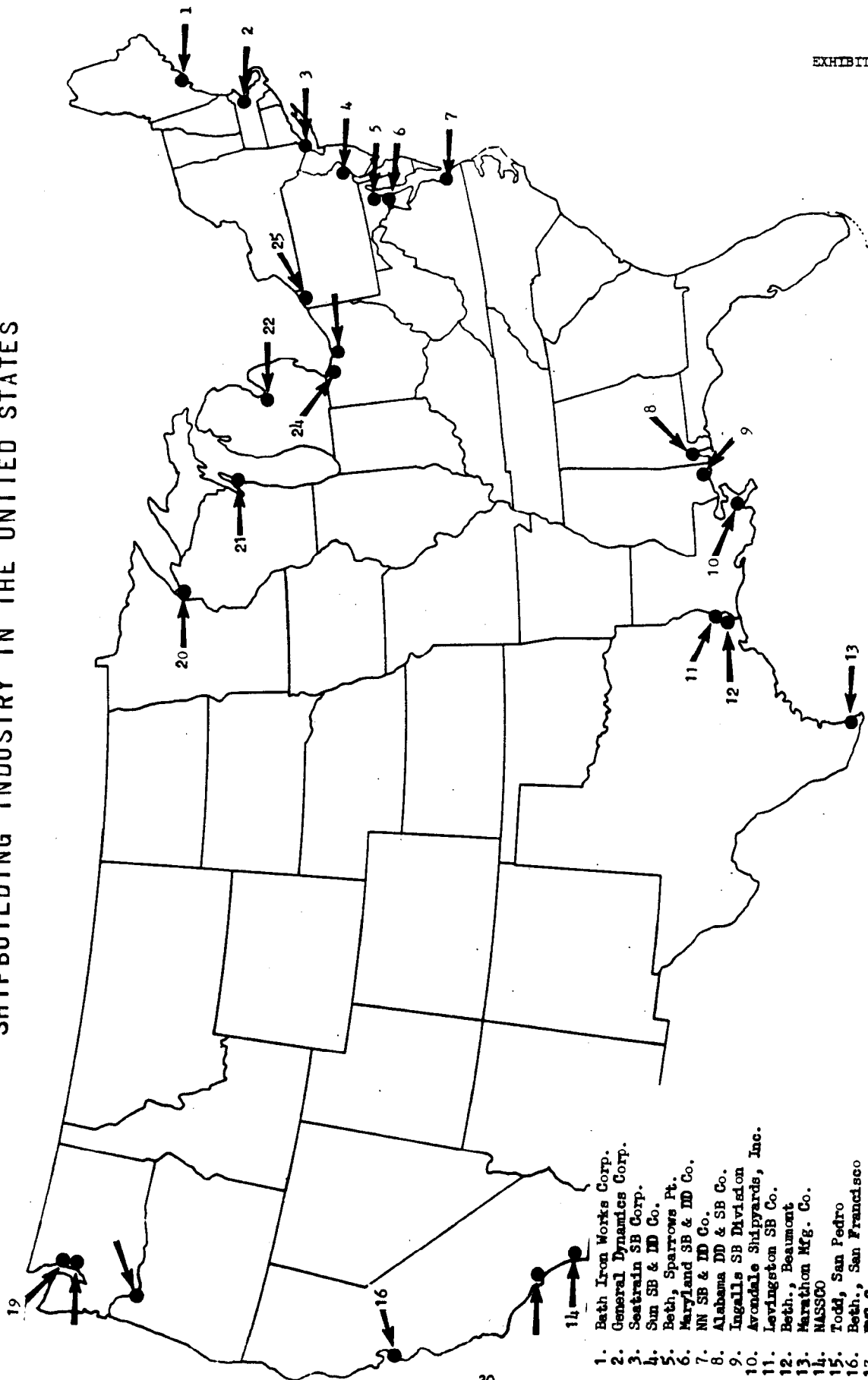
### Major Topside Repair Facilities

Major topside repair facilities are those that have the capability to provide repair service to ocean going ships when the work can be accomplished without taking the ships out of the water. These facilities usually lease pier space on a job basis and do not have any type of drydocking installations. Services rendered by these firms vary from a simple repair job to a major topside overhaul. In many instances a shop will send its personnel and equipment to provide voyage repairs while the ship is working cargo at a commercial marine terminal.

Appendix C is a list of 59 topside facilities. No attempt has been made to tabulate their machinery and equipment due to the variance of the type of work an individual firm will engage in. Detailed data for many of the facilities has been obtained during the annual survey and is available for official use.

# SHIPBUILDING INDUSTRY IN THE UNITED STATES

EXHIBIT 1

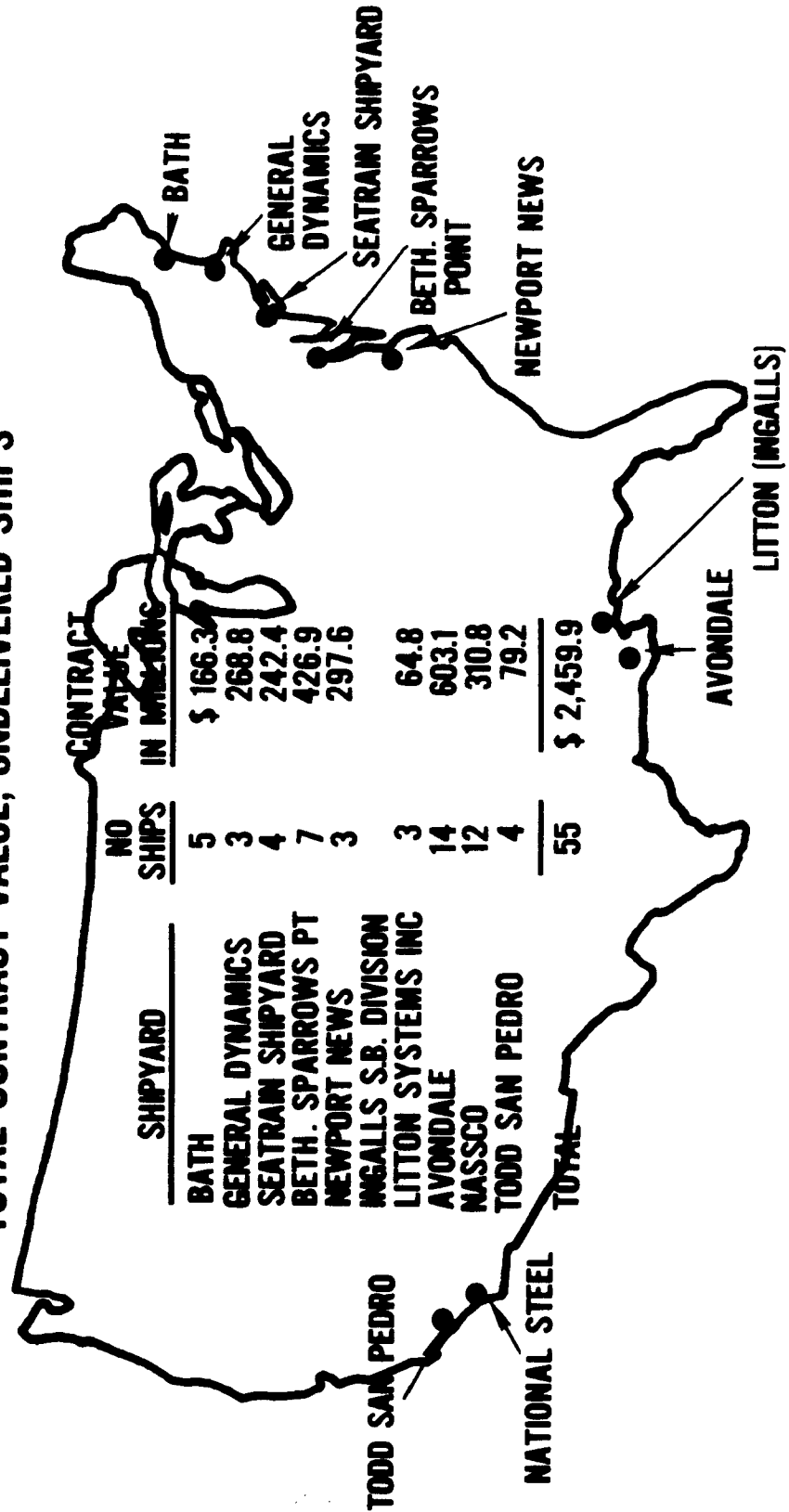


MAJOR AMERICAN SHIPYARDS  
BUILDING CAPACITY - SHIPS 175 FEET IN LENGTH OR OVER

1. Bath Iron Works Corp.
2. General Dynamics Corp.
3. Seatrail SB Corp.
4. Sun SB & ID Co.
5. Beth, Sparrows Pt.
6. Maryland SB & ID Co.
7. NN SB & ID Co.
8. Alabama DD & SB Co.
9. Ingalls SB Division
10. Avondale Shipyards, Inc.
11. Levinston SB Co.
12. Beth., Beaumont
13. Marathon Mfg. Co.
14. NASCO
15. Todd, San Pedro
16. Beth., San Francisco
17. FMC Corp.
18. Lockheed SB & Constr. Co.
19. Todd, Seattle
20. Fraser Shipyards
21. Ray SB Corp.
22. Defco SB Co.
23. American SB Co., Lorain
24. American SB Co., Toledo
25. Erie Marine

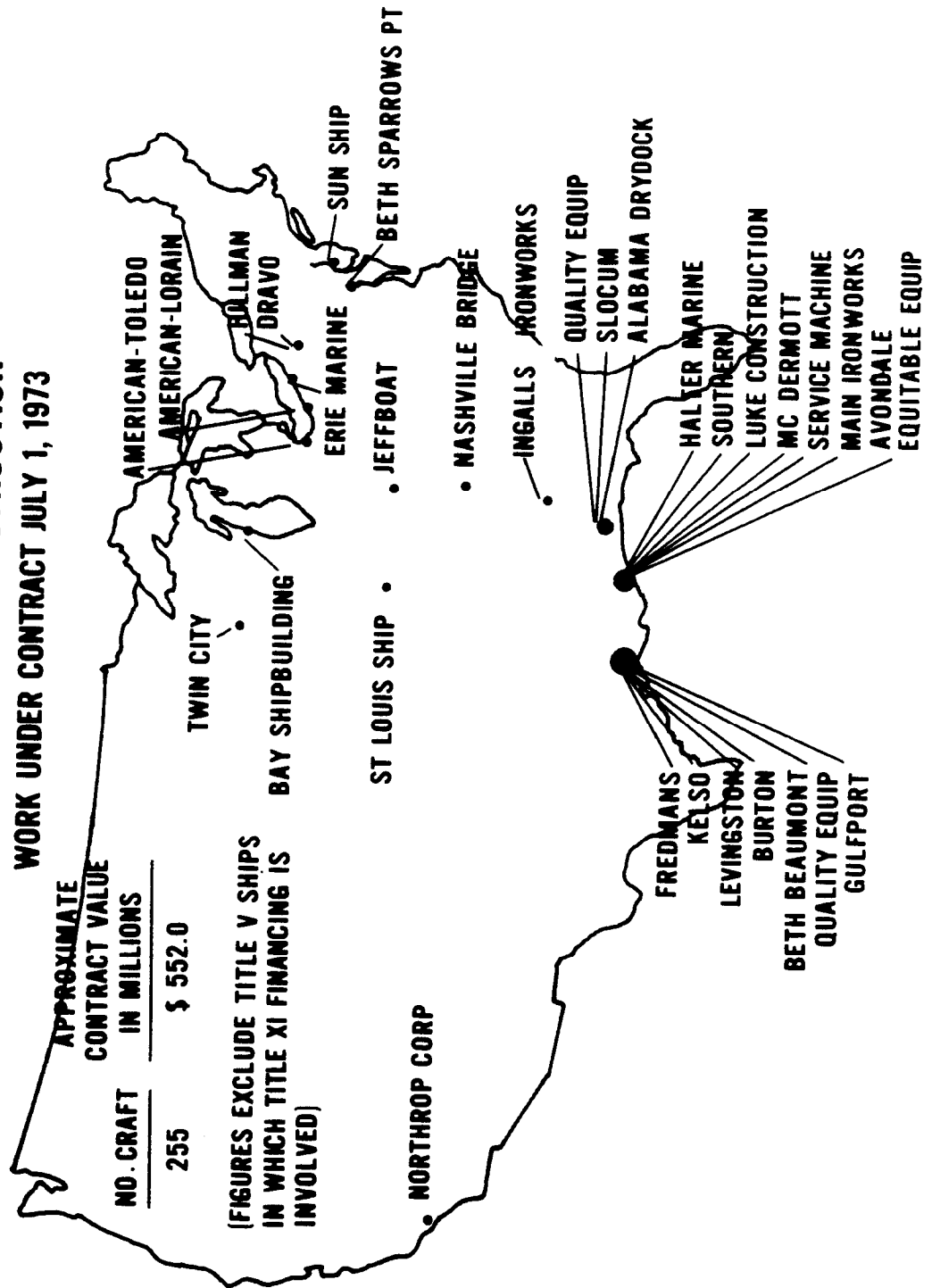
# SHIPBUILDING PROGRAM (TITLE V) OFFICE OF SHIP CONSTRUCTION

SHIPS UNDER CONTRACT JULY 1, 1973  
TOTAL CONTRACT VALUE, UNDELIVERED SHIPS



# SHIP FINANCING GUARANTEE CONSTRUCTION PROGRAM (TITLE XI) OFFICE OF SHIP CONSTRUCTION

WORK UNDER CONTRACT JULY 1, 1973

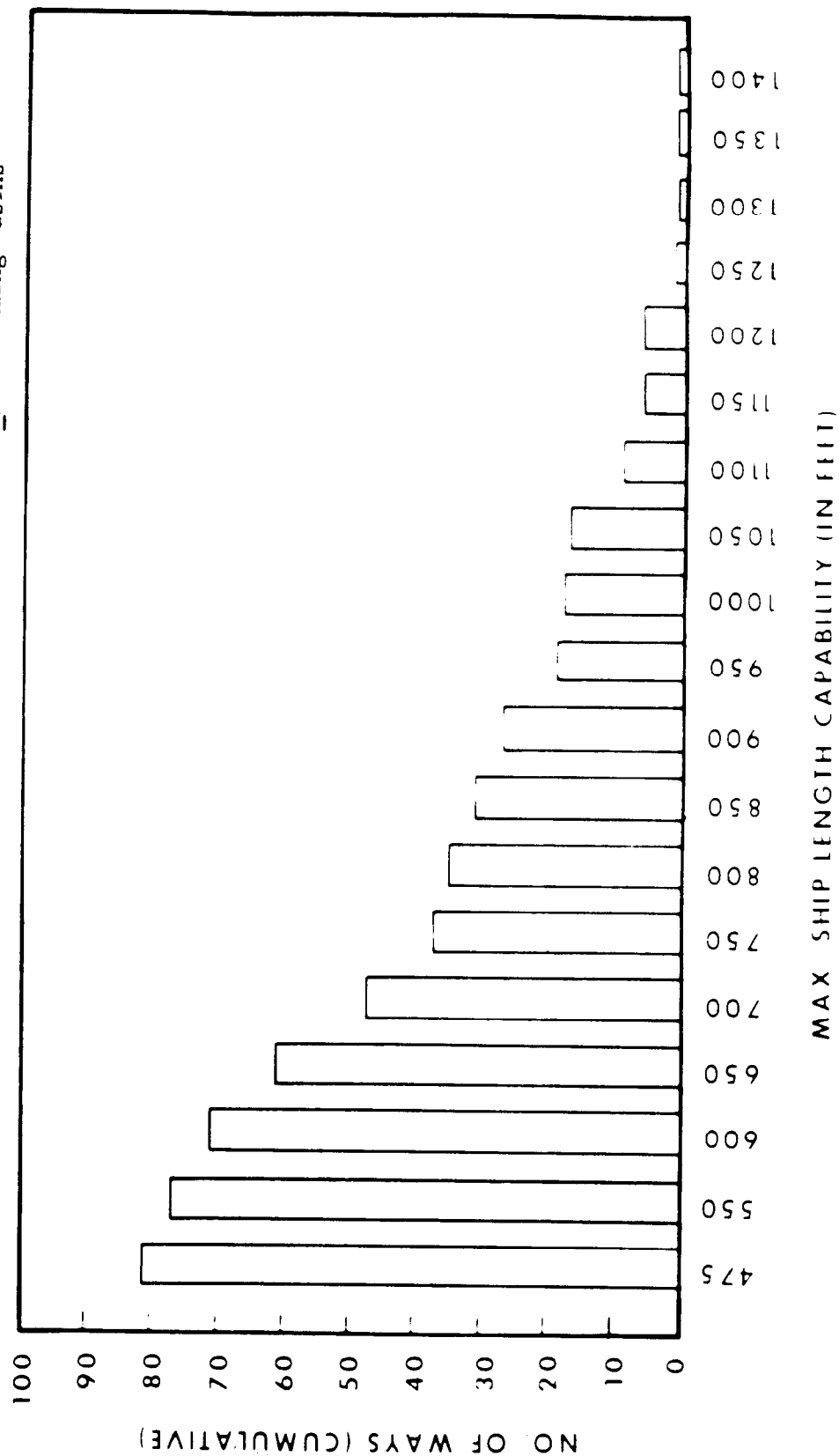


# MAJOR U.S. PRIVATE SHIPYARDS

## NUMBER OF SHIPWAYS BY MAXIMUM LENGTH CAPABILITY<sup>1/</sup>

### (DECEMBER 1973)

<sup>1/</sup> Including Basins



Ship Construction Capability by Ship Type

Region	Shipyard	Shipway or Basin	Maximum Ship Size	General Cargo						Dry Bulk		
				Rob. Cargo 475 x 68	Container 610 x 90	RO/RO 684 x 102	LASH 693 x 100	Container 947 x 106		21,300 570 x 75	51,000 600 x 105	100,000 900 x 106
East	Bath Iron Works	A	550 x 88	1	1	0	0	0		1	0	0
		B	700 x 130	1	1	1	0	0		1	1	0
		C	700 x 130	(3)	(3)	(2)	(0)	(0)		(3)	(2)	(0)
	Bethlehem Steel, Sparrows, Pt.	5	575 x 80	1	0	0	0	0		1	0	0
		6	650 x 90	1	1	0	0	0		1	0	0
		7	900 x 108	1	1	1	1	0		1	1	1
		8	650 x 90	1	1	0	0	0		1	0	0
		9	650 x 90	1	1	0	0	0		1	0	0
		10	900 x 108	1	1	1	1	0		1	1	1
			1200 x 192	4	3	2	1	1		4	3	1
				(10)	(8)	(4)	(3)	(1)		(10)	(5)	(3)
	General Dynamics, Quincy	6	860 x 123	2	1	1	0	0		1	1	0
		7	940 x 143	2	1	1	1	0		1	1	1
		8	860 x 123	2	1	1	0	0		1	1	0
		11	865 x 144	2	1	1	0	0		1	1	0
		12	865 x 145	2	1	1	0	0		1	1	0
	Maryland S/B & D/D			(10)	(5)	(5)	(1)	(0)		(5)	(5)	(1)
		1	630 x 96	1	1	0	0	0		1	0	0
	Newport News S/B & D/D			(1)	(1)	(0)	(0)	(0)		(1)	(0)	(0)
		6	715 x 93	1	1	0	0	0		1	0	0
		7	715 x 93	1	1	0	0	0		1	0	0
		8	940 x 125	2	1	1	1	0		1	1	1
		9	940 x 125	2	1	1	1	0		1	1	1
		10	960 x 128	2	2	1	1	1		2	1	1
		11	1100 x 140	3	2	1	1	1		2	2	1
		CSD	1600 x 230	9	5	4	1	1		6	4	1
				(20)	(13)	(6)	(5)	(3)		(14)	(9)	(5)

TABLE I

Region	Shipyard	Shipway or Basin	Maximum Ship Size	General Cargo					Dry Bulk			
				Mob. Cargo 475 x 68	Container 610 x 90	RO/RO 684 x 102	LASH 893 x 100	Container 947 x 106	22,300 570 x 75	51,000 600 x 105	100,000 900 x 106	
Gulf	Seatrain S/B Corp.	3	720 x 112	1	1	1	0	0	1	1	0	
		5	1094 x 143	3	2	1	1	1	3	2	1	
		6	1094 x 143	3	(5)	(3)	(2)	(2)	3	(5)	(2)	
	Sun S/B & D/D	1	700 x 92	1	1	1	0	0	1	1	0	
		2	700 x 92	1	1	1	0	0	1	1	0	
		6	745 x 132	1	1	1	0	0	1	1	0	
		8	745 x 129	1	1	1	0	0	1	1	0	
	TOTAL EAST COAST				(4)	(4)	(4)	(0)	(0)	(4)	(4)	(0)
					55	39	26	11	6	44	30	11
	Gulf	Alabama D/D & S/B	1	523 x 68	1	0	0	0	0	0	0	0
2			523 x 68	1	0	0	0	0	0	0	0	0
3			523 x 68	1	0	0	0	0	0	0	0	0
4			523 x 68	1	0	0	0	0	0	0	0	0
5			620 x 90	1	1	0	0	0	0	1	0	0
				(5)	(1)	(0)	(0)	(0)	(1)	(0)	(0)	
Avondale		1	600 x 80	5	0	0	0	0	0	5	0	0
		2	1200 x 130	6	5	3	3	3	3	6	5	3
				(11)	(5)	(3)	(3)	(3)	(11)	(5)	(3)	
Beth Beaumont		1	842 x 96	1	1	1	1	0	0	1	0	0
					(1)	(1)	(1)	(0)	(0)	(1)	(0)	(0)
Levingston	1	1100 x 90	2	1	1	0	0	0	1	0	0	
					(2)	(1)	(0)	(0)	(0)	(1)	(0)	(0)
Litton/Ingalls	1	690 x 85	1	1	1	0	0	0	1	0	0	
	2	550 x 80	1	0	0	0	0	0	0	0	0	
	6	555 x 90	1	0	0	0	0	0	0	0	0	

Region	Shipyard	Shipway or Basin	Maximum Ship Size	General Cargo					Dry Bulk				
				Mob. Cargo 475 x 68	Container 610 x 90	RO/HO 684 x 102	LASH 893 x 100	Container 947 x 106		21,300 570 x 75	51,000 600 x 105	100,000 900 x 106	
West	Litton/Ingalls, con't	7	650 x 90	1	1	0	0	0	0	1	0	0	
		8	650 x 90	1	1	0	0	0	0	1	0	0	
		9	650 x 90	1	1	0	0	0	0	1	0	0	
		10	650 x 90	1	1	0	0	0	0	1	0	0	
		WB	1050 x 177	6 (13)	6 (11)	6 (6)	6 (6)	6 (6)	6 (11)	6 (6)	6 (6)	6 (6)	
	Marathon	1	1400 x 200	4 (4)	4 (4)	4 (4)	1 (1)	1 (1)	4 (4)	4 (4)	1 (1)	1 (1)	
		TOTAL GULF COAST											
					36	23	14	10	10		29	15	10
	West	Beth. San Francisco	4	550 x 90	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
FMC Corporation		4	650 x 105	1 (1)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	1 (1)	0 (0)	
Lockheed S/B		1	600 x 90	1	0	0	0	0	0	1	0	0	
		3	595 x 86	1	0	0	0	0	0	1	0	0	
		21	690 x 90	1 (3)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	
National Steel & S/B		1	605 x 90	1	0	0	0	0	0	1	0	0	
		2	700 x 90	1	1	0	0	0	0	1	0	0	
		3	900 x 106	1	1	1	1	1	0	1	1	1	
	4	900 x 106	1 (4)	1 (3)	1 (2)	1 (2)	1 (0)	1 (4)	1 (2)	1 (2)	1 (2)		
Todd, San Pedro	1	800 x 84	1	1	0	0	0	0	1	0	0		
	2	800 x 84	1 (2)	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)		

36



Region	Shipyard	Shipway or Basin	Maximum Ship Size	General Cargo						Dry Bulk		
				Mob. Cargo 475 x 68	Container 610 x 90	HO/BO 684 x 102	LASH 893 x 100	Container 947 x 106		22,300 570 x 75	51,000 600 x 105	100,000 900 x 106
Great Lakes	Todd, Seattle	1A	550 x 96	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)
	American S/B-Lorain	3	700 x 75	1	0	0	0	0		1	0	0
		4	700 x 75	1	0	0	0	0		1	0	0
		GD3	*730 x 79	1 (3)	0 (0)	0 (0)	0 (0)	0 (0)		1 (1)	0 (0)	0 (0)
	American Ship, Tododo	2	666 x 75	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)		1 (1)	0 (0)	0 (0)
Bay S/B Corp.	3	*730 x 79	1	1	0	0	0	0		1	0	0
	4	*700 x 79	1	1	0	0	0	0		1	0	0
	5	600 x 70	1 (3)	0 (2)	0 (0)	0 (0)	0 (0)	0 (0)		0 (2)	0 (0)	0 (0)
Defoe S/B Co.	1	*730 x 79	2	1	0	0	0	0		1	0	0
	2	*730 x 79	2 (4)	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)		1 (2)	0 (0)	0 (0)
Erie Marine	1	*730 x 79	2 (2)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)		1 (1)	0 (0)	0 (0)
	Fraser	1	*730 x 79	1 (1)	1 (1)	0 (0)	0 (0)	0 (0)		1 (1)	0 (0)	0 (0)
TOTAL GREAT LAKES				14	6	0	0	0		10	0	0
TOTAL ALL YARDS				117	75	42	23	16		93	48	23

\* Controlling Ship Size for Saint Lawrence Seaway

Region	Shipyard	Shipway or Basin	Maximum Ship Size	Tankers							ORO		
				25,000 620 x 75	38,000 688 x 90	89,000 894 x 105	120,000 920 x 138	125,000 Cu. Ft. 932 x 140	225,000 1100 x 140	265,000 1100 x 78	380,000 1265 x 194	80,000 886 x 106	160,000 998 x 143
East	Bath Iron Works	A	650 x 82	1	0	0	0	0	0	0	0	0	0
		B	700 x 130	1	1	0	0	0	0	0	0	0	0
		C	700 x 130	(3)	(2)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
	Bethlehem Steel, Sparrows Point	5	575 x 80	0	0	0	0	0	0	0	0	0	0
		6	650 x 90	1	0	0	0	0	0	0	0	0	0
		7	900 x 108	1	1	1	0	0	0	0	1	0	0
		8	650 x 90	1	0	0	0	0	0	0	0	0	0
		9	650 x 90	1	0	0	0	0	0	0	0	0	0
		10	900 x 108	1	1	1	0	0	0	0	0	0	0
			1200 x 192	3	2	1	1	1	1	1	0	1	1
				(8)	(4)	(3)	(1)	(1)	(1)	(1)	(0)	(3)	(1)
	General Dynamics, Quincy	6	860 x 123	1	1	0	0	0	0	0	0	0	0
		7	940 x 143	1	1	1	1	1	0	0	0	1	0
		8	860 x 123	1	1	0	0	0	0	0	0	0	0
		11	865 x 144	1	1	0	0	0	0	0	0	0	0
	Maryland S/B & D/D	12	865 x 145	1	1	0	0	0	0	0	0	0	0
				(5)	(5)	(1)	(1)	(1)	(0)	(0)	(0)	(1)	(0)
		1	630 x 96	1	0	0	0	0	0	0	0	0	0
	Newport News S/B & D/D			(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
		6	715 x 93	1	1	0	0	0	0	0	0	0	0
		7	715 x 93	1	1	0	0	0	0	0	0	0	0
		8	940 x 125	1	1	1	0	0	0	0	0	1	0
		9	940 x 125	1	1	1	0	0	0	0	0	1	0
		10	960 x 128	1	1	1	0	0	0	0	0	1	0
		11	1100 x 140	2	1	1	0	1	1	1	0	1	1
		CSD	1600 x 230	6	1	2	1	1	1	1	1	2	1
				(13)	(10)	(6)	(2)	(2)	(2)	(1)	(1)	(6)	(2)

Region	Shipyard	Shipway or Basin	Maximum Ship Size	Tankers								OSO	
				25,000 620 x 75	38,000 688 x 90	89,000 894 x 105	120,000 920 x 138	125,000 Gr. Ft. 932 x 140	225,000 1100 x 140	265,000 1100 x 78	380,000 1265 x 194	80,000 886 x 106	160,000 998 x 143
Gulf	Seatrain S/B Corp.	3	720 x 112	1	1	0	0	0	0	0	0	0	0
		5	1094 x 143	2	1	1	1	1	1	0	0	1	1
		6	1094 x 143	(5)	(3)	(2)	(2)	(2)	(2)	(0)	(0)	(2)	(2)
		1	700 x 92	1	1	0	0	0	0	0	0	0	0
		2	700 x 92	1	1	0	0	0	0	0	0	0	0
	Sun S/B & D/D	6	745 x 132	1	1	0	0	0	0	0	0	0	0
		8	745 x 129	1	1	0	0	0	0	0	0	0	0
				(4)	(4)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
				29	28	12	6	6	5	2	1	12	5
	TOTAL EAST COAST												
Alabama D/D & S/B	1	523 x 68	0	0	0	0	0	0	0	0	0	0	0
	2	523 x 68	0	0	0	0	0	0	0	0	0	0	0
	3	523 x 68	0	0	0	0	0	0	0	0	0	0	0
	4	523 x 68	0	0	0	0	0	0	0	0	0	0	0
	5	620 x 90	1	0	0	0	0	0	0	0	0	0	0
Avondale	1	600 x 80	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
	2	1200 x 130	5	3	3	0	0	0	0	0	0	0	0
Beth Beaumont	1	842 x 96	1	1	0	0	0	0	0	0	0	0	0
			(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Levingston	1	1100 x 90	1	1	0	0	0	0	0	0	0	0	0
			(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Litton/Ingalls	1	690 x 85	1	0	0	0	0	0	0	0	0	0	0
	2	550 x 80	0	0	0	0	0	0	0	0	0	0	0
	6	555 x 90	0	0	0	0	0	0	0	0	0	0	0

[illegible]

Region	Shipyard	Shipway or Basin	Maximum Ship Size	Tankers								OBO			
				25,000 620 x 75	38,000 688 x 90	89,000 894 x 105	120,000 920 x 138	125,000 Cu. Ft. 932 x 140	225,000 1100 x 140	265,000 1100 x 78	380,000 1265 x 194	80,000 886 x 106	160,000 996 x 143		
Great Lakes	Todd, San Pedro	1	800 x 84	1	0	0	0	0	0	0	0	0	0	0	0
		2	800 x 84	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Todd, Seattle	1A	550 x 96	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	TOTAL WEST COAST			10	4	2	0	0	0	0	0	0	0	0	0
	American S/B-Lorain	3 4 GD3	700 x 75 700 x 75 *730 x 79	1 1 1 (3)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)
Great Lakes	American Ship, Toledo	2	666 x 75	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Bay S/B Corp.	3 4 5	*730 x 79 *700 x 79 600 x 70	1 1 0 (2)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)	0 0 0 (0)
	Defoe S/B Co.	1 2	*730 x 79 *730 x 79	1 1 (2)	0 0 (0)	0 0 (0)	0 0 (0)	0 0 (0)	0 0 (0)	0 0 (0)	0 0 (0)	0 0 (0)	0 0 (0)	0 0 (0)	0 0 (0)
	Erie Marine	1	*730 x 79	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Region	Shipyard	Shipway or Basin	Maximum Ship Size	25,000 620 x 75	38,000 688 x 90	89,000 894 x 105	120,000 920 x 138	125,000 Cu. Ft. 932 x 140	225,000 1100 x 140	265,000 1100 x 78	380,000 1265 x 194		80,000 886 x 106	160,000 998 x 143
Fraser Shipyards				1	0	0	0	0	0	0	0	0	0	0
TOTAL GREAT LAKES				1	0	0	0	0	0	0	0	0	0	0
TOTAL ALL YARDS				82	47	26	13	13	6	3	2		22	12

\* Controlling Ship Size for Saint Lawrence Seaway

# SUMMARY

REGION	GENERAL CARGO						DRY BULK			
	Mob. Cargo 475 x 68	Container 610 x 90	RO/RO 684 x 102	LASH 893 x 100	Container 947 x 106		21,300 570 x 75	51,000 600 x 105	100,000 900 x 106	
East Coast	55	39	26	11	6		44	30	11	
Gulf Coast	36	23	14	10	10		29	15	10	
West Coast	12	7	2	2	0		10	3	2	
Great Lakes	14	6	0	0	0		10	0	0	
TOTAL ALL YARDS	117	75	42	23	16		93	48	23	

# TANKERS

REGION	TANKERS										OBO	
	25,000 620 x 75	38,000 688 x 90	89,000 894 x 105	120,000 920 x 138	125,000 Cu. Ft. 932 x 140	225,000 1100 x 140	265,000 1100 x 78	380,000 1265 x 194	80,000 886 x 106	160,000 998 x 143		
East Coast	39	28	12	6	6	5	2	1	12	5		
Gulf Coast	23	15	12	7	7	1	1	1	10	7		
West Coast	10	4	2	0	0	0	0	0	0	0		
Great Lakes	10	0	0	0	0	0	0	0	0	0		
TOTAL ALL YARDS	82	47	26	13	13	6	3	2	22	12		

TABLE II  
December 1973

MAJOR U.S. PRIVATE SHIPYARDS

NUMBER OF SHIPBUILDING WAYS BY LENGTH (MAX. SHIP SIZE)

Length OA (In Feet):	475	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1300	1400
<u>ATLANTIC COAST</u>																	
Bath Iron Works	3	3	3	3	2												
Beth. Sparrows Point	7	7	6	6	3	3	3	3	3	1	1	1	1	1	1		
General Dynamics, Quincy	5	5	5	5	5	5	5	5	1								
Maryland SB & DD	1	1	1	1													
Newport News SB & DD	6	6	6	6	6	4	4	4	4	2	1	1	1				
Seatrains SB Corp.	3	3	3	3	3	2	2	2	2	2	2	2					
Sun SB & DD	4	4	4	4	4												
TOTAL	(29)	(29)	(28)	(27)	(23)	(14)	(14)	(14)	(10)	(5)	(4)	(4)	(2)	(1)	(1)		
<u>GULF COAST</u>																	
Alabama DD & SB	5	1	1														
Avondale	8	8	8	3	3	3	3	3	3	3	3	3	3	3	3		
Beth. Beaumont	1	1	1	1	1	1	1										
Ingalls-E. Bank	7	7	5	5													
Ingalls-W. Bank	6	6	6	6	6	6	6	6	6	6	6	6					
Levingston SB Co.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Marathon	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TOTAL	(29)	(25)	(23)	(17)	(12)	(12)	(12)	(11)	(11)	(11)	(11)	(11)	(5)	(4)	(4)	(1)	(1)



MAJOR U.S. PRIVATE SHIPYARDS

NUMBER OF SHIPBUILDING WAYS BY LENGTH (MAX. SHIP SIZE)

Length OA (In Feet):	475	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1300	1400
----------------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------

PACIFIC COAST

Beth-San Francisco	1	1															
FMC Corporation	1	1	1	1													
Lockheed SB	3	3	2	1													
National Steel & SB	4	4	4	3	3	2	2	2	2								
Todd-San Pedro	2	2	2	2	2	2	2										
Todd-Seattle	1	1															

TOTAL

(12)	(12)	(9)	(7)	(5)	(4)	(2)	(2)
------	------	-----	-----	-----	-----	-----	-----

GREAT LAKES\*

American SB-Lorain	3	3	3	3	1	1	1										
American SB-Toledo	1	1	1	1													
Bay SB Corp.	3	3	3	2	2	2											
Defoe SB Co.	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1		
Erie Marine	1	1	1	1	1	1	1	1	1	1	1						
Fraser Shipyards	1	1	1	1	1	1	1										

TOTAL

(11)	(11)	(11)	(10)	(9)	(7)	(5)	(4)	(4)	(3)	(3)	(2)	(2)	(1)	(1)
------	------	------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

GRAND TOTAL

All Coasts & Great Lakes

81	77	71	61	49	37	35	31	27	19	18	17	9	6	1	1
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

\*Maximum size ship that can exit St. Lawrence Seaway locks is 730' x 79'.

## APPENDIX A

**17-101**

[illegible]

Fire protection..... FP-G.P.M.-P.S.I.  
Sanitary sewer..... SS-Yes or No.  
Sheet 2 of 6

PRINCIPAL SHOPS AND BUILDINGS									
NAME OF SHOP OR BUILDING	DIMENSIONS OF SHOP OR BUILDING	MATERIALS PROCESSED (See note)	LARGEST EXIT		WEIGHT OF MATERIAL OR NUMBER AND SIZE OF UNITS PRODUCED PER 8 HOURS (See note)	ALL OTHER SHOPS (List names and dimensions, include mold loft, if any)			
			Width	Height					
Fabricating									
Plate			x x x x	x x x x					
Sheet metal									
Subassembly									
Carpenter			x x x x	x x x x	x x x x x x x				
Woodworking			x x x x	x x x x	x x x x x x x				
Boat assembly or molding									
Machine		x x x x x x x	x x x x	x x x x	x x x x x x x				
Electrical		x x x x x x x	x x x x	x x x x	x x x x x x x				
Electronic		x x x x x x x	x x x x	x x x x	x x x x x x x				
Pipe									
Galvanizing						NOTE—Indicate materials as steel, aluminum, reinforced plastic, wood, plywood, sheet metal, etc.			
Foundry									
Rigger		x x x x x x x	x x x x	x x x x					

BRIDGE TYPE				SHOP OR YARD CRANES (5 tons or over)					STATIONARY, RAIL OR MOBILE			
Cap. (Std. tons)	Max. span	Height of hook	Area/shop serviced	Type	Cap. (Std. tons)	Max. reach	Capacity at reach	Boom length	Height hinge	Area serviced	Hgt. of hook above base at out reach	

MAJOR ITEMS OF MACHINE TOOLS AND EQUIPMENT (List briefly such of the large items as will indicate the capacities of all important shops in maximum work piece size, e.g., 30" plate bending rolls, 10" plate shears, 400 ton Hyd. press, 30" plate furnace, engine lathe 36" x 20" b.c., etc.)

STORAGE SPACE (Sq. ft.) FOR COMPONENTS AND MATERIALS (Less boat storage) (List dimensions for each area, plus type material stored)

RAW STEEL STORAGE (Sq. ft.)

WELDING AND ASSEMBLY (Sq. ft.)

ACREAGE LEGALLY CONTROLLED

IN USE

DEVELOPED (including in use)	TOTAL (including undeveloped)
------------------------------	-------------------------------

EXISTING LOCAL ORDINANCES LIMITING PRODUCTIVE USE

LIMITATIONS IMPOSED BY PROPERTY ZONING CLASSIFICATION

YARD LAYOUT—PLEASE FURNISH A PLOT PLAN OF YARD OR PLANT, IF AVAILABLE

LOCATION OF PRODUCTION FACILITIES FOR PRODUCTS LISTED IN ITEM 11, OF STD. FORM 129				ON WATERFRONT <input type="checkbox"/> Yes <input type="checkbox"/> No					
EMPLOYMENT	CURRENT	CURRENT NO. SHIFTS	MOBILIZATION—SHIFTS						
Management, administration									
Professional, engineering									
Professional, technical (AM others)									
Production, skilled									
Production, semiskilled									
Production, unskilled									
Nonproduction									
Total		x x x x x x			x x x x				
NUMBER OF PRODUCTION PERSONNEL PRESENTLY ENGAGED IN SHIP AND/OR BOAT IN SHIP OR BOAT REPAIR CONSTRUCTION									
APPROXIMATE TOTAL EMPLOYMENT OF ALL AFFILIATED CONCERNS ONLY LISTED IN ITEM 8, OF STD. FORM 129 (NOTE:—An affiliate is a concern that directly, or indirectly through one or more intermediaries controls, or is controlled by, or is under common control with, the reporting firm. Common ownership of stock by individuals does not in itself, constitute affiliation.)									
DISTANCE TO NEAREST RAILROAD CONNECTION			DISTANCE TO NEAREST AIRPORT—IDENTIFY						
LARGEST CONVEYANCE AVAILABLE AND MAXIMUM DIMENSIONS OF LOAD, FOR OVERLAND TRANSPORTATION OF FINISHED PRODUCTS (Not to exceed limitations imposed by local ordinances)									
NAVIGATIONAL RESTRICTIONS (INDICATE ALL AT M.L.W.) <table border="1"> <tr> <td>MINIMUM CHANNEL TO TIDEWATER</td> <td>MINIMUM HORIZONTAL AND VERTICAL BRIDGE CLEARANCES TO TIDE-WATER (Identify structures)</td> </tr> <tr> <td colspan="2">LIMITING LOCK DIMENSIONS TO TIDEWATER (Identify locks)</td> </tr> </table>						MINIMUM CHANNEL TO TIDEWATER	MINIMUM HORIZONTAL AND VERTICAL BRIDGE CLEARANCES TO TIDE-WATER (Identify structures)	LIMITING LOCK DIMENSIONS TO TIDEWATER (Identify locks)	
MINIMUM CHANNEL TO TIDEWATER	MINIMUM HORIZONTAL AND VERTICAL BRIDGE CLEARANCES TO TIDE-WATER (Identify structures)								
LIMITING LOCK DIMENSIONS TO TIDEWATER (Identify locks)									

PROJECTS UNDER CONSTRUCTION WHICH WILL ALTER NAVIGATIONAL RESTRICTIONS (Specify projects and state effect and estimated completions)

DESCRIPTION OF TYPES OF WORK NORMALLY SUBCONTRACTED

PRODUCTION EXPERIENCE (List at least three of the largest and the most complex ships or boats constructed, indicating (1) date completed, (2) hull length, beam, and molded depth, (3) type propulsion unit (fully described), (4) horsepower, (5) electrical and/or electronic installation, (6) special piping features, (7) size and tensile strength of plates, if steel, or type hull material, if other than steel, (8) special annealing, heat treating, or stress relieving problems encountered, if steel, plus, (9) any other important problems resolved). (NOTE:—If no previous construction experience give detailed description of major conversion or industrial manufacturing work considered comparable to ship or boat construction.)

## MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

## LEGEND: Remarks Column

- 1/ Type of work usually engaged in
- 2/ Employment - current/ mobilization
- 3/ MSR - Hold Master Ship Repair Contract issued by:
  - (M) Maritime Administration
  - (N) Navy
  - (MSC) Military Sealift Command
  - (A) Army
  - (AF) Air Force
  - (AE) Army Corps of Engineers



MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES 1/

1/ Shipbuilding: for ships 475' x 68' or above.  
 Repair: drydocking facilities for ships 300'  
 in length or above.

NAME AND LOCATION	Max. Ship Size (LOA-Beam) SW-Shipway, CD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable lgth. in Ft. Longest Total Linear Yard	Water Depth In Yard Channel	Remarks
<u>EAST COAST</u> <u>SHIPBUILDING YARDS</u>				
Bath Iron Works Corp. Bath, Maine	650 (+) x 88 SW (2) 700 x 130 SW	850 2900	35 27	1/ Construction, conversion, and repairs-all types of vessels 2/ 224.5/12000 3/ MSR (M) (N) Uses drydock facilities in Boston area or Baltimore, but has floating bow drydock for sonar domes.
Bethlehem Steel Corp. Sparrows Point, Md.	575 x 80 SW (3) 650 x 90 SW (2) 900 x 108 SW 1200 x 192 CD	1260 3968	30 21	1/ New ship construction - to vessels 1200' in length 2/ 3925/15500

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCAT. CO.	Fac. Ship Size (ICA-Peak) SW-Shipway, GD-Graving Drydock, FD-Floating Drydock LR-Marine Railway	Berths/Piers Usable lgth. in Ft. Longest Total linear Feet	Water Depth In Yard Channel	Remarks
General Dynamics Corporation Quincy Division Quincy, Massachusetts	(2) 600 x 125 GD 900 x 143 GD 865 x 114 GD 865 x 145 GD 550 x 75 FD	852 4621	42 35	1/ Construction, conversion, and repairs - all types of vessels to 1000' in length and 14.5' beam. 2/ 2440/24000 3/ NSR (F) (N) (AE) All graving docks are used for construction.
Maryland SE and PD Co. Baltimore, Maryland	690 x 90 SG 775 x 106 GD 715 x 90 FD	190 5651	35 35	1/ Construction, conversion, and repairs - all types of vessels. 2/ 1720/12000 3/ LSR (F) (N) (ISC) (A) (AE) Docks can be modified to provide double ways for narrower beamed ships or can be extended to provide greater length.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCAT. CO.	Max. Ship Size (LOA-Form) SM-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Newport News Shipbuilding and DD Co. Newport News, Virginia	(2) 715 x 53 SM (2) 940 x 125 SM * 940 x 128 GD * 1100 x 140 GD 650 x 92 GD 862 x 118 GD 458 x 72 GD	<u>1078</u> 12430	<u>45</u> 50	1/ Construction, conversion, and repairs - all types of vessels to 1000' in length. 2/ 26600/41000 3/ MR (G) (N) (NSC) (AS) * Used for construction Newport News has nuclear design, construction, and repair capability.
Seatrain Shipbuilding Corp. Brooklyn, New York	720 x 112 GD (2) 1094 x 143 GD	<u>1200</u> 3190	<u>36</u> 41	1/ Construction of Supertankers 2/ 2725/N.A.
Sun Shipbuilding and Dry Dock Company Chester, Pennsylvania	(2) 700 x 92 SM 745 x 132 SM 745 x 129 SM 1005 x 135 FD	<u>400</u> 2890	<u>26</u> 40	1/ Construction, conversion, and repairs - all types of vessels. 2/ 4000/35000 3/ MR (G) (N) (NSC)

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Peak) SW-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
<u>EAST COAST</u>				
<u>REPAIR YARDS WITH DRYDOCK FACILITIES</u>				
Bethlehem Steel Corporation Baltimore, Maryland	520 x 83 775 x 108 675 x 95 585 x 78 450 x 58	$\frac{964}{12944}$	$\frac{48}{25}$	1/ Ship repairs and Conversion 2/ 1675/9900 3/ MSR (H) (H) (MSC) (A) (AE)
Bethlehem Steel Corporation East Boston, Massachusetts	670 x 90 523 x 85	$\frac{1020}{3111}$	$\frac{20}{30}$	1/ Ship repairs and Conversion 2/ 270/800 3/ MSR (M) (N) (MSC) (A)
Bethlehem Steel Corporation Hoboken, New Jersey	443 x 63 685 x 103 549 x 87 640 x 90	$\frac{923}{2994}$	$\frac{44}{32}$	1/ Ship repairs and Conversion 2/ 650/7300 3/ MSR (M) (H) (MSC) (A) (AE)

# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Beam) SA-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Brewer Drydock Company Staten Island, New York	352 x 52 FD 486 x 71 FD 459 x 63 FD	$\frac{653}{4091}$	$\frac{31}{31}$	1/ Ship repairs and Conversion 2/ 225/1700 3/ MSR (H) (N) (MSC) (A) (AE)
Bromfield Corporation United Shipbuilding Division East Boston, Massachusetts	376 x 40 FD	$\frac{430}{1113}$	$\frac{26}{32}$	1/ Ship repairs and Conversion 2/ 95/500 3/ MSR (N) (MSC) (AE)
Ira S. Bushey & Sons, Inc. Brooklyn, New York	455 x 71 FD 300 x 66 FD	$\frac{786}{4086}$	$\frac{22}{36}$	1/ Ship repairs and Conversion 2/ 215/720 3/ MSR (H) (N) (MSC) (A) (AE)
Coastal Drydock & Repair Corporation Brooklyn, New York	349 x 66 GD 479 x 90 GD 700 x 121 GD	$\frac{575}{1150}$	$\frac{26}{41}$	1/ Ship repairs and Conversion 2/ 250/2500 3/ MSR (H) (A) (AE)

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Loc. Ship Size (101-Penn) SJ-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Colonne's Shipyard Inc. Norfolk, Virginia	300 x 40 MR 360 x 65 MR	900 2200	25 22	1/ General ship repair 2/ 135/305 3/ MSR (H) (N) (MSC) (A) (AE)
Detyens Shipyards, Inc. Mt. Pleasant, South Carolina	500 x 82 FD	300 600	25 21	1/ General ship repair 2/ 290/700 3/ MSR (H)
Jacksonville Shipyards, Inc. Jacksonville, Florida	530 x 85 FD (2) 633 x 93 FD 400 x 56 FD* 420 x 82 FD 827 x 144 FD	647 3629	20 34	1/ Primarily ship repairs and Conversion 2/ 2410/4840 3/ MSR (M) (N) (MSC) (A) (AE) * Leased from Navy.
Norfolk Shipbuilding & Dry Dock Corporation Norfolk, Virginia	670 x 84 FD 500 x 65 SW 316 x 64 FD 441 x 64 MR	1420 10172	22 35	1/ Ship repairs and Conversion. Construction of small vessels. 2/ 1825/3400 3/ MSR (H) (H) (MSC) (A) (AE)

# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Penn) SL-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft.  Longest Total linear Feet	Water Depth  In Yard Channel	Remarks
Perth Amboy Dry Dock Company Perth Amboy, New Jersey	336 x 70 FD	400 2130	20 30	1/ Ship repairs and Conversion 2/ 150/650 3/ MSR (N) (A) (AE)
Puerto Rico Dry Dock & Marine Terminals, Inc.	614 x 81 GD	N.A. 1220	N.A.	1/ Ship Repairs 2/ N.A. 3/ MSR (N)  Leases Naval Industrial Reserve Shipyard.
Rodermund Industries, Inc. Jersey City, New Jersey	360 x 58 FD	812 812	16 14	1/ Ship repairs 2/ 120/170 3/ MSR (N) (N) (MSC) (A) (AE)
Savannah Machine and Shipyard Company Savannah, Georgia	520 x 72 GD	382 1563	26 N.A.	1/ Ship repairs and conversion 2/ 100/800 3/ MSR (N) (N) (MSC) (A) (AE)

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Beam) SL-Shipway, CD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Earths/Fliers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Todd Shipyards Corporation Brooklyn, N.Y.	716 x 89 GD 622 x 92 FD 755 x 96 FD 460 x 96 FD	1152 7653	47 42	1/ Ship repairs and Conversion 2/ 500/4000 3/ MSR (M) (N) (MSC) (A)
Tracor Marine, Inc. Port Everglades, Fla.	360 x 80 (Sincrolift with 400' transfer system)	1080 1880	30 31	1/ Ship repairs 2/ 300/N.A.



# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Beam) Sh-Shipway, GD-Graving Drydock, FD-Floating Drydock LR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
<u>GULF COAST</u>  Alabama Dry Dock and Shipbuilding Company Mobile, Alabama	(4) 523 x 68 620 x 90 620 x 84 750 x 105 380 x 64	1132 13290	24 40	1/ Ship construction, conversion, and repairs, and barge construction. 2/ 2640/26000 3/ MSR (N) (P) (FSC) (AF) (A)
Avondale Shipyards, Inc. New Orleans, La.	* 600 x 80 **1200 x 130 378 x 68 300 x 50	1625 3565	18 40	1/ Construction and repair of ships, grilling rigs, and barges. 2/ 7330/18000 3/ MSR (N) (P) (FSC) (A) (AF) (AE) * In No. 1 way, 5 vessels can be in different stages of construction simultaneously. ** In No. 2 way, 5 vessels can be in different stages of construction simultaneously (or up to 6 vessels if total lengths of each pair do not exceed 1200')

# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Pann) SW-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Avondale Shipyards, Inc. New Orleans, La. Continued				Avondale uses drydock facilities, if needed, at Todd, New Orleans or Alabama Dry Dock and Shipbuilding Company.
Bethlehem Steel Corporation Beaumont, Texas	242 x 96 (50 x 84)	1100 4,550	40 30	1/ Construction of barges and drilling rigs. Also ship repair and conversion. 2/ 2735/5050 3/ MSR (H) (H) (OSC) (AE)
Ingalls Shipbuilding Division, Litton Systems, Inc. Pascagoula, Mississippi	690 x 85 550 x 80 555 x 90 SW (4) 650 x 90 * 1050 x 177 FD 460 x 60 GD	2,500 9000	45 30	1/ Construction, conversion, overhaul - all types of vessels. 2/ 17000/21000 3/ MSC (H) (H) (OSC) (AE) * West Tank-Can launch ship up to 1050' x 177'. Equivalent of six shipways. Ingalls has nuclear construction and repair capability.

# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Beam) SW-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Levingston Shipbuilding Company Orange, Texas	1100 x 90 SW 350 x 62 FD 420 x 120 FD	520 2430	30 25	1/ Construction of oil drilling rigs, boats and barges. 2/ 1850/3700 3/ MSR (N) (FSC) (AE)
Marathon Mfg. Company Gulf Marine Division Brownsville, Texas	1400 x 200 SW	N.A.	N.A.	1/ Construction of offshore drilling platforms and drill ships. Yard has capability of building large ocean-going ships. 2/ 1620/N.A.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Beam) SM-Shipway, CD-Craving Drydock, FD-Floating Drydock LR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
<u>GULF COAST</u>				
<u>REPAIR YARDS WITH DRYDOCK FACILITIES</u>				
Saucer Marine Service, Inc. New Orleans, Louisiana	(2) 300 x 59 FD	200 750	16 31	1/ Construction and repair of small vessels and barges. 2/ 70/200 3/ MSR (N)(MSC) (A) (AE)
Southern Shipbuilding Corporation Slidell, Louisiana	350 x 54 GD	200 300	13 13	1/ Construction and repair of vessels up to 350' in length and not drawing over 15' of water. 2/ 350/2660 3/ MSR (N) (A) (AE)
Tampa Ship Repair & Dry Dock Company, Inc. Tampa, Florida	550 x 75 GD	1200 2605	25 36	1/ Ship repairs and conversion 2/ 700/1100 3/ MSR (N) (N) (MSC) (A) (AE)

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Feet) SM-Shipway, CD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Todd Shipyards Corporation Galveston, Texas	614 x 86 FD	1086 4835	30 35	1/ Ship repairs and conversion. Also nuclear related work. 2/ 1115/4000 3/ MSR (N) (N) (MSC) (A) (AE) (AF)
Todd Shipyards Corporation Houston, Texas	* 600 x 95 600 x 100 SW FD	1844 3271	20 35	1/ Ship repairs and conversion. Construction of barges and vessels up to 600' in length. 2/ 1100/2600 3/ MSR (N) (N) (MSC) (A) (AE) * Max. length launch in one piece about 475' but can launch in two pieces and join in drydock.
Todd Shipyards Corporation New Orleans, Louisiana	661 x 90 601 x 80 FD FD	1725 4956	35 45	1/ Ship repairs and conversion 2/ 430/2500 3/ MSR (N) (N) (MSC) (A) (AE)

# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Beam) SW-Shipway, CD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
<u>WEST COAST</u>  <u>SHIPBUILDING YARDS</u>  Bethlehem Steel Corporation San Francisco, California	550 x 90 700 x 97 950 x 148 SW FD FD	813 2172	32 32	1/ Ship repairs and conversion. Can build C3 and C4 type vessels. 2/ 5000/3310 3/ MSR (M) (N) (NSC) (A) (AF) (AE)
FMC Corporation Portland, Oregon	650 x 105 SW	600 1060	36 40	1/ Construction of vessels up to 650' in length 2/ 1220/2440 3/ MSR (M) (A)
Lockheed Shipbuilding & Construction Company Seattle, Washington	600 x 90 595 x 86 650 x 90 600 x 50 525 x 80 600 x 92 SW SW SW FD FD FD	810 2540	25 30	1/ Ship Construction, conversion, and repair 2/ 1500/6600 3/ MSR (M) (N) (NSC) (A) (AE)

# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Beam) SW-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
National Steel and SB Company San Diego, California	* 605 x 90 SW 700 x 90 SW (2) 900 x 106 SW 350 x 50 FD	900 6000	30 2F	1/ Construction, conversion, and repairs - all types of vessels 2/ 3310/4500 3/ MSR (H) (N) (FSC) * Extendable for ships 700' LOA and higher light ship weights Graving dock is leased from Unified Port District of San Diego.
Todd Shipyards Corporation San Pedro, California	(2) 800 x 84 SW 563 x 85 FD 665 x 85 FD	680 4800	25 No restriction	1/ Construction, repairs, and conversion - all types of vessels. 2/ 1350/8,000 3/ MSR (F) (N) (FSC) (A)
Todd Shipyards Corporation Seattle, Washington	* 550 x 96 SW 650 x 85 FD 420 x 63 FD 550 x 92 FD	1137 5030	4F 45	1/ Ship Construction, repairs, and conversion. 2/ 505/7200 3/ MSR (H) (N) (FSC) (A) (A.E) * Max. 600' x 120' under special circumstances

# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Feet) SH-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
<u>WEST COAST</u>				
<u>REPAIR YARDS WITH DRYDOCK FACILITIES</u>				
Albina Engine & Machine Works Portland, Oregon			N.A. 40	1/ Ship repairs and conversion 2/ 335/7000 2/ MSR (N) (H) (MSC) (AE) Leases drydocks and berths from Port of Portland as required.
Bethlehem Steel Corporation San Pedro Yard Terminal Island, California	530 x 86 680 x 94 FD FD	1800 4175	52 35	1/ Ship repairs 2/ 415/7500 2/ MSR (H) (N) (MSC) (A)
California Shipbuilding & Dry Dock Company Long Beach, California	330 x 68 FD	600 1700	52 60	1/ Ship Repairs 2/ 200/560 2/ MSR (H) (H) (MSC)



MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Feet) SV-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Campbell Industries- Marine Division San Diego, California	360 x 50      FD	$\frac{575}{1975}$	$\frac{26}{22}$	1/ Construction of fishing boats and ferry boats. Also ship repairs. 2/ 880/1300 3/ MSR (H) (N) (MSC) Graving dock is leased from Unified Port District of San Diego.
Dillingham Shipyard Division of Dillingham Corporation Honolulu, Hawaii	350 x 53      FD	$\frac{550}{750}$	$\frac{24}{35}$	1/ Ship repairs 2/ 150/N.A. 3/ MSC (N) (H) (MSC)
Lake Union Dry Dock Company Seattle, Washington	340 x 50      FD	$\frac{1000}{4235}$	$\frac{35}{30}$	1/ Ship repairs and conversion 2/ N.A./1200 3/ MSC (H) (N) (MSC) (AE)
Merritt Ship Repair Co. Oakland, California	320 x 52      FD	$\frac{600}{1155}$	$\frac{28}{32}$	1/ Ship and barge repairs 2/ 10/240 3/ MSR (H) (MSC)

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Feet) SM-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Northwest Marine Iron Works Portland, Oregon			11.4. 45	1/ Ship repairs and conversion 2/ 240/950 3/ MSR (H) (H) (MSC) (A) (AF) Leases drydocks and berths from Port of Portland as required.
San Diego Marine Construction Corporation San Diego, California	380 x 80 FD	700 1855	30 30	1/ Construction of ships, boats and barges up to 250' in length. 2/ 650/11.4. 3/ MSR (H) (H) (MSC)
Todd Shipyards Corporation San Francisco Division Alameda, California	523 x 68 FD 900 x 125 FD	800 2427	30 35	1/ Ship repairs and conversion 2/ 500/530 3/ MSR (H) (H) (MSC) (A) (AF) (AF)

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Beam) SW-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Willamette Iron & Steel Company Portland, Oregon		1232 1232	45 45	1/ Ship repairs and conversion 2/ 1190/2235 3/ MSR (N) (N) (MSC) (A) (AE) Leases drydocks and berths from Port of Portland as required
Willamette Iron & Steel Company Richmond, California	570 x 80 740 x 80 563 x 80 (2) 570 x 80 GD GD GD GD	1560 1560	35 No Restriction	1/ Ship repairs and Conversion 2/ 515/2170 3/ MSR (N) (N) (MSC)

# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Beam) SM-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
<u>GREAT LAKES</u> <u>SHIPBUILDING YARDS</u> (Maximum size ship that can exit St. Lawrence Seaway lock is 730' x 79')				
American Ship Building Company Lorain, Ohio	(2) 700 x 75 SW 730 x 75 GD 925 x 125 GE	1000 2870	25 27	1/ Construction, repairs, and conversion - all types of vessels. 2/ 730/3600 3/ MSR (H) (MSC) (AE)
American Ship Building Company Toledo, Ohio	666 x 75 GD 540 x 64 GD	800 1710	21 25	1/ Construction, repairs, and conversion - all types of vessels. 2/ 590/4700 3/ MSR (C)

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Penn) SW-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable Lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
Bay Shipbuilding Corporation Sturgeon Bay, Wisconsin	770 x 100 SW 700 x 60 SW 600 x 70 SW 640 x 70 FD	220 7095	28 21	1/ Ship Construction, conversion, and repairs 2/ 615/N.A. 3/ MSR (H)
Defoe Shipbuilding Company Bay City, Michigan	1145 x 100 SW 1200 x 70 SW	1200 2756	25 25	1/ Ship Construction and repairs 2/ 100/7090 3/ MSR (H) (AE)
Erie Marine Division of Litton Industries Erie, Pennsylvania	1000 x 195 GD	1130 1130	27 27	1/ Ship Construction and repairs 2/ 130/N.A. Ships are built in basin
Fraser Shipwards, Inc. Superior, Wisconsin	625 x 82 GD	900 4450	27 27	1/ Ship construction and repairs 2/ 170/5000 3/ MSR (N) (A) (AE) Ships are built in basin

# MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

NAME AND LOCATION	Max. Ship Size (LOA-Penn) SH-Shipway, GD-Graving Drydock, FD-Floating Drydock MR-Marine Railway	Berths/Piers Usable lgth. in Ft. Longest Total Linear Feet	Water Depth In Yard Channel	Remarks
<u>GREAT LAKES</u>  <u>REPAIR YARDS WITH DRYDOCK FACILITIES</u>				
American Ship Building Company Chicago, Illinois	710 x 75      GD	$\frac{850}{1300}$	$\frac{18}{27}$	1/ Ship repairs and conversion 2/ 115/350
Peterson Builders, Inc. Sturgeon Bay, Wisconsin	342 x 39      FD	$\frac{240}{1245}$	$\frac{16}{22}$	1/ Construction and repair of ships and boats 2/ 430/1200 3/ MSR (H) (A) (AE)

FACILITIES AVAILABLE FOR PERFORMING TOPSIDE REPAIRS ON SHIPS

300' IN LENGTH AND OVER

EAST COAST

Ardell Marine Corporation  
Brooklyn, New York

Atlantic Repair Co., Inc.  
Brooklyn, New York

Berkley Shipbuilding & Drydock Corp.  
Norfolk, Virginia

Cardinal Engine & Boiler Works, Inc.  
Brooklyn, New York

Diesel Injection Sales & Service, Inc.  
Norfolk, Virginia

General Ship Repair Corporation  
Baltimore, Maryland

Hudson Engineering Company  
Hoboken, New Jersey

Marine Electric Corporation  
Brooklyn, New York

A. Moe & Co., Inc.  
Philadelphia, Pennsylvania

Munro Drydock Inc.  
Chelsea, Massachusetts

Port Engineering Services Corp.  
Ft. Lauderdale, Florida

Stephen Ransom, Inc.  
Newark, New Jersey

Tickle Engr. Works. Inc.  
Brooklyn, New York

Arnessen Electric Company, Inc.  
Brooklyn, New York

Banks Ship Rigging Corporation  
Brooklyn, New York

Best Repair Company  
Norfolk, Virginia

Charlton Marine, Inc.  
Jersey City, New Jersey

Electric Motor and Contracting Co.  
Norfolk, Virginia

Horne Brothers, Inc.  
Newport News, Virginia

Metro Machine Corporation  
Norfolk, Virginia

Moon Engineering Company, Inc.  
Norfolk, Virginia

Nordic Diesel & Machine Co., Inc.  
Brooklyn, New York

Reynolds Shipyards Corporation  
Staten Island, New York

Surless Ship Repair Corporation  
Brooklyn, New York

Wilmington Iron Works, Inc.  
Wilmington, North Carolina

### GULF COAST

American Marine Corporation  
New Orleans, La.

Champion Machine Works, Inc.  
New Orleans, La.

Dixie Machine Welding & Metal Works, Inc.  
New Orleans, La.

Frolich Iron Works, Inc.  
New Orleans, La.

Harrisburg Machine Co., Inc.  
Houston, Texas

McDonough Iron Works  
Galveston, Texas

Slocum Iron Works, Inc.  
Mobile, Ala.

Boland Marine and Mfg. Co.  
New Orleans, La.

Coastal Marine Service of Texas, Inc.  
Port Arthur, Texas

Farmer's Marine Copper Works, Inc.  
Galveston, Texas

Gulf - Tampa Drydock Co.  
Tampa, Florida

Buck Kreihs Co., Inc.  
New Orleans, La.

Runyon Machine & Boiler Works, Inc.  
Pensacola, Florida

### WEST COAST

Cavanaugh Machine Works  
Wilmington, California

Ets-Hokin Corporation  
San Francisco, California

Franklin Machine Works, Inc.  
San Francisco, California

Honiron, Division of Ward Foods, Inc.  
Honolulu, Hawaii

Pacific Marine & Supply Company, Inc.  
Honolulu, Hawaii

Rowe Machine Works, Inc.  
Seattle, Washington

Triple "A" Machine Shop, Inc.  
San Francisco, California

West Winds, Inc.  
San Francisco, California

Duwamish Shipyard, Inc.  
Seattle, Washington

Ets-Hokin Corporation  
Wilmington, California

Harbor Boat Building Company  
Terminal Island, California

Martinolich Shipbuilding Corporation  
Tacoma, Washington

Port Welding & Machine Works, Inc.  
Wilmington, California

Service Engineering Company  
San Francisco, California

Western Boat Building Corporation  
Tacoma, Washington



GREAT LAKES

William Ferrel, Inc.  
Toledo, Ohio

Lower Lake Dock Company  
Sandusky, Ohio

Oldman Boiler Works, Inc.  
Buffalo, New York

G. & W. Industries, Inc.  
Cleveland, Ohio

Nicholson & Hall Corporation  
Buffalo, New York

Pittsburgh & Conneaut Dock Company  
Conneaut, Ohio